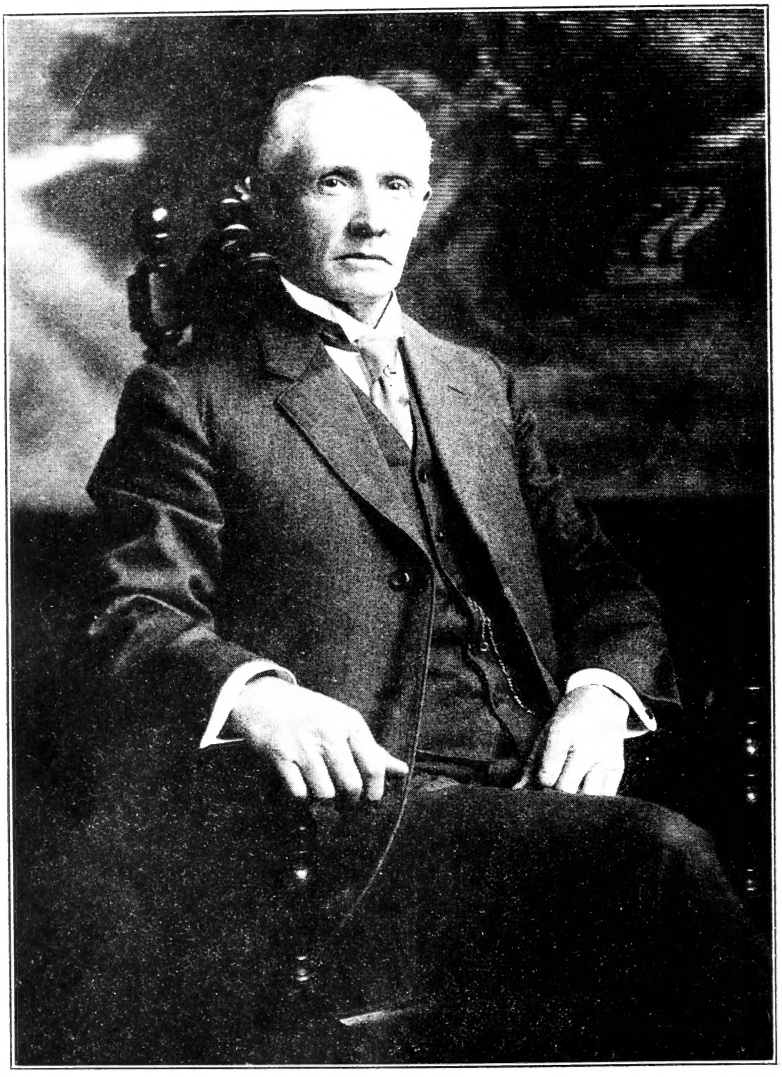
# THE TAYLOR SYSTEM OF PRUNING

By AMBROSE TAYLOR



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# The TAYLOR SYSTEM of PRUNING

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Being an efficient method of pruning deciduous fruit trees for best results, as developed by the author after twenty-five years of practical work and study, and containing valuable information as to the care and irrigation of the orchard, the preparing of the ground for planting, the handling and drying of the fruit, etc., etc.

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No 1.

Orchard of French Prune trees. It represents trees that have been cut to form a strong crotch. This is the proper crotch that trees should have to keep them from splitting. The crotch of these trees was formed by the cutting back system when they were young, according to the system of forming the crotch of a tree described in this book.

Limb of a French Prune tree, 30 inches long, with 72 prunes on it. This is a sample of fruit grown in an orchard that has been pruned by the Taylor system for three years.

Limb of an Imperial Prune tree, 9 inches long, with about 16 prunes on it. This tree has been pruned the last two years by the Taylor system. This orchard was non-productive before using this system to renew it.

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# FOREWORD

I WISH to explain to my readers my motive in writing this little book. I have spent half of my lifetime, or over twenty-five years, in studying the effects of pruning deciduous fruit trees. The main part of my experience has been adapted to California soil and climate.

Any knowledge gained from reading books I did not consider as knowledge until I proved it, by my own experimenting.

I had no idea of writing a book on this subject when I started to study the life of a tree. My great love of Nature led me to become more interested in the underlying principles that govern this particular phase or expression of life. The tree has the same interest to me that the human body has to the surgeon. The same plan or system exists in the life of a tree that exists in our own physical body.

I regret that I have not kept exact records of all my experimenting along these lines, though I feel that it would have been a difficult task, had I undertaken to keep notes of the many discoveries that I have made, as my whole life and mind has been absorbed in this very interesting study. I sometimes feel that words are inadequate to express all that I wish to give out to my fellow-workers in the fruit industry, and I am not able to express all that I know on this great subject in this little book. I only hope to awaken the minds of the fruit growers to the value of careful and scientific methods of pruning deciduous fruit trees and give to them an exact system in concise form which they can readily follow and prove the merit of same to their own satisfaction.

Through experience I have learned that there is no such thing as chance in Nature. There is a cause for every outward manifestation of life we see.

We may not be familiar with the first principles that govern what we see. I agree with the Apostle Paul when he said that it was the "Unseen that was real." It is the unseen that is the cause. There is little use to deal with effects when we overlook the cause.

When we have an understanding of the cause that will produce certain effects, it is possible to formulate a system. This is what I endeavored to do, and I have been successful in formulating a system of pruning deciduous fruit trees favorable to the soil and climate of California.

After spending so many years to establish this system of pruning, I felt that I did not want to monopolize what I knew for my own exclusive use. It was my earnest desire to give the general public the opportunity to receive it. I felt that I wished that every man who was interested could have the advantage of what it has taken me so many years to prove.

At first I thought of trying to teach. This was the only medium I could think of through which to give out my knowledge to the world. I soon found, however, that it would overtax my strength to try to teach all who were eager for information on this subject. I realized that, if it could be given out in some effective form, it would mean millions of dollars added to the income of those engaged in the fruit industry.

When I affirm that I have proved the system I am giving out, I wish to emphasize it in such a way that it will make an impression on the minds of my readers, so that they may have faith and not doubt that I have not thoroughly tested every rule, or the different cuts, on the several varieties of fruit trees that this book treats of. I am not writing of some one else's experiments, or of some experiments that I have not had sufficient evidence of the result to prove that it can be satisfactorily relied upon.

That there is a system in Nature, I know every close observer of Nature or one who lives in close touch with natural laws governing the universe will concede to be a fact. If this is true, there is no reason why we should not discover the system that governs any particular department of Nature.

I claim that I have discovered many of the natural laws that govern the life of fruit trees in California. I ask my readers to make use of my rules, and when they have tested them thoroughly they will have the knowledge that I wish them to gain through a careful reading and study of this book.

Experience is the only true teacher. We cannot always depend on what we read in books. Practical experience can be depended on. We are helped by being given rules to follow from the other fellow's experience. I have tried to be the pathfinder, or pioneer, in this work, although there is an awakening of interest at the present time in this subject.

The latter part of 1914 I discovered that the University of California had opened up a department dealing with Pomology. Since that time I have been very much interested in the growth of their work, and there has been a co-operative interest existing between myself and the Professors in charge, as well as the class of students that are under the instruction of that department. I sincerely sympathize with this work, and I feel that the interest has just begun in trying to understand the effects of scientific principles in cutting a tree.

This system that I have decided to give out in book form, I know will benefit many people. I have decided to use this medium for teaching what I can conscientiously say is a reliable system of pruning deciduous fruit trees, because of the many requests of interested friends and fruit growers, and also because of my own consciousness of the great need in the fruit growing industry of scientific knowledge, gained through a lifetime of practical experience.

Yours sincerely,

AMBROSE TAYLOR.

CHAPTER I.

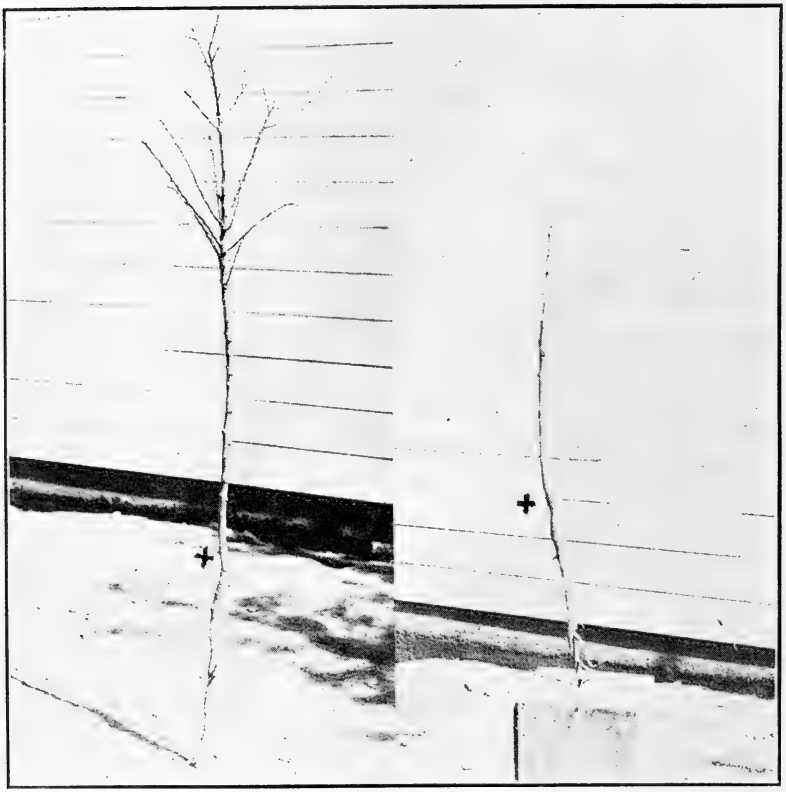
# Preparing the Soil and Setting Trees

THE first thing to be thought of in starting the growth of trees is to see that the soil is in a good productive state. It is a good idea to make some investigation of the elements of the soil and its adaption to the growth of certain varieties of trees, and also study the scientific methods of supplying the elements that are lacking to produce the active growth of trees.

There is so much that can be written about the many varieties of soils in the State of California, it would fill a book itself, which I have no idea of doing. I intend to confine myself to a few useful hints necessary to fruit growers, in order for them to get the best results from selecting suitable soil for their purpose, also to aid them by giving them some simple rules to follow in preparing the different soils for setting trees.

In preparing the soil for setting trees, it is well to begin by sowing vetch, barley or oats after the first rains in the fall of the year and plowing this crop under the following year, the latter part of March or the first of April, and plow it over again in June of the same year. This will be enough cultivation until the first of the next year. When the trees are set in January or February the soil should be thoroughly cultivated at that time, plowed deeply and disked so that the soil is well pulverized and in a good tillable condition.

This method of using a cover crop to enrich the soil requires the sacrifice of a year's crop, which many fruit growers cannot afford. For that reason, I would not advise this treatment of the soil if it is in a good productive condition, but if it is in an impoverished condition it is not a waste of time to start from the foundation by building up the soil, giving it the proper stimulation necessary to feed and nourish strong and fruitful trees.



Showing an Apricot tree in its natural form when brought from the nursery, and the same tree properly cut to a stub, ready for setting. Cross marks indicate where the tree was budded onto the root.

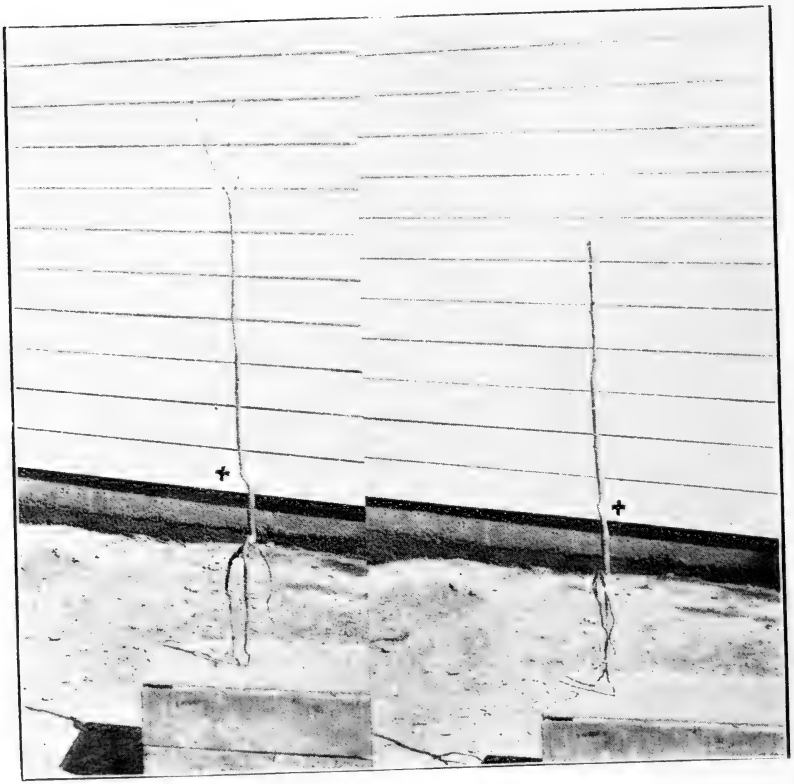
I will mention a few well known varieties of soil in the State. There are the heavy soils such as the doby and clay. These soils need special cultivation. They should be plowed deep, not less than 8 or 10 inches in depth, and thoroughly disked, so that the ground becomes well pulverized. The light soils, such as the sandy, need not be plowed over 5 or 6 inches deep, and less cultivation in other ways. The latter grade of soil is easy to cultivate. It does not require much more than half of the work that the heavy soils need to keep them in a good condition.

There is a section of land in this State that is called the hard-pan soil. I mention this because in its natural state it is very poor land for fruit trees. It can be used for berries or small fruit. It cannot be made profitable for fruit trees unless the hard surface is dynamited through to the under soil, which is very productive. With good drainage and plowing this soil can be brought out. I have known trees to thrive well in this soil after the dynamiting process.

It is not necessary to use a fertilizer on the heavy soils at tree setting time. The lighter soils will be benefited by the use of manure, if care is used not to let it come in close contact with the trees. It should not be permitted to be any closer than 4 inches to the tree. It has the effect of burning the tree if it is too near, and at the setting time stage the tree has not strength to survive. Many people make this mistake and the result is that they lose their trees, by them dying at an early age.

I think it is the safest not to use a fertilizer until the second year. I especially recommend it to be used on the light soils not later than the second year.

It is not my intention of treating extensively of the soils, as this is not in my line. There are soil experts that specialize in analyzing different soils and discovering the elements that are lacking and advising just what kind of a fertilizer should be used to supply the elements that are needed. It is not extravagance to secure the best knowledge on a subject of so much importance to the fruit grower as the productive elements of the soil.



Showing a two-year-old French Prune tree, in its natural form when brought from the nursery, and the same tree properly cut to a stub, ready for setting. The cross marks indicate where the tree was budded onto the root.

## NURSERY STOCK.

I feel that a few remarks regarding nursery stock may inspire my readers to take a deeper interest in this important factor in successful fruit growing. The more interest and appreciation that the fruit grower gives to nursery stock, the more the nurseryman will try to become efficient in his special part of carrying out the purpose of obtaining the best results in horticulture.

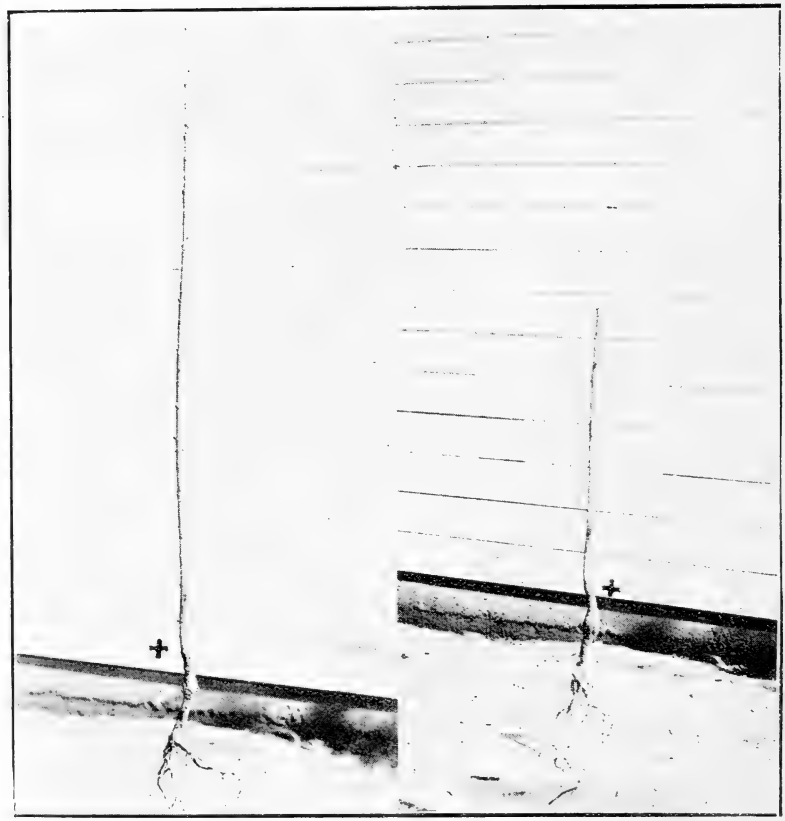
I assume that the majority of my readers have some knowledge of the life and growth of trees. In what is termed in human life as the prenatal period, in tree life it is the presetting period, or the period of growth that takes place in the nursery previous to the setting.

For those that have no knowledge regarding the nursery work or the beginning of the life of a tree, I will explain that the seed is planted in the nursery usually in November or December.

Trees grown from seed planted from October the 24th until November the 23rd will produce trees that would have more fruitful and reproductive qualities. This is owing to planetary conditions. The sun is passing through the zodiacal sign of Scorpio at this time of the year, which is a fruitful and reproductive sign. This comes under the heading of astrology. If more attention were given to the influence of planetary conditions on the earth and its products, there would be greater results derived from the resources of the earth.

The planting of the seed is to form the root part of the tree. My readers may not think that it is important to have the elements of fruitfulness in this part of the tree, but that is a mistake. The root of the tree is the source of supplying the life principle to the tree.

After the seed is planted it should grow from two to three years before it is budded. The season for budding trees is usually the months of August and September. The last part of August, after the 21st of the month, up to the 20th of September, planetary conditions are favorable, because the sun is pass-



Showing a Cherry tree with a one-year-old top budded onto a four-year-old root, and the same tree properly cut to a stub, ready for setting. The cross marks indicate where the tree was budded onto the root.

ing through the zodiacal sign of Virgo at this time of the year. It is a sign that favors any kind of chemistry, and it is at this time that the chemical process of blending the root stock and the scion or the tree takes place. This time of the year is favorable for any kind of tree grafting. In fact it has been used in modern times unconscious of the natural laws governing it. There are many rules we follow today that have been given us by former generations, that had more scientific knowledge than we have about the laws of Nature.

The nurseries have been using almond, apricot, peach and myrobolin root to form the stock or the body of the tree. After this is two or three years of age the budding of the scion or tree onto this root takes place. The growth above the bud is cut away to give the new tree or scion a chance to draw the vitality from the root.

I wish to make it impressive that the scions that are used for budding trees should be chosen from the strong and vigorous part of the tree and not from the wild growth that is lacking in fruitful properties.

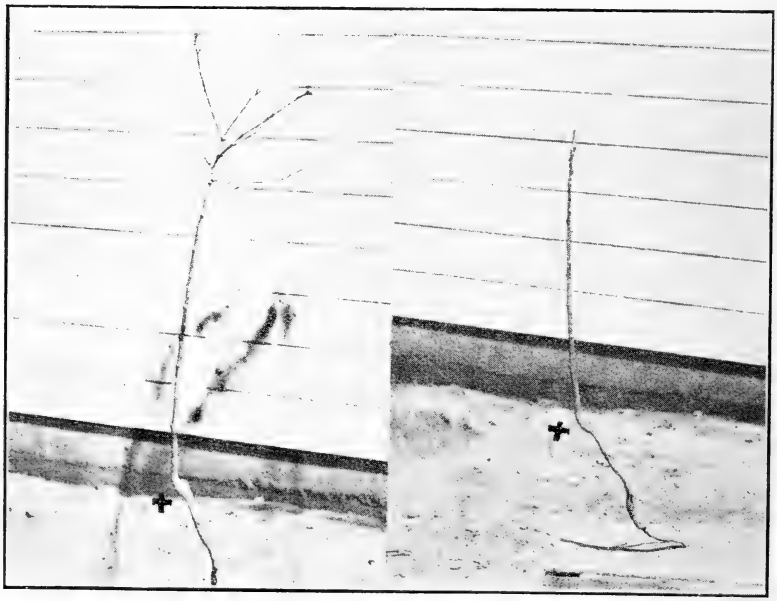
After the tree has been budded onto the root, it should grow from one to three years, and sometimes it is let grow a much longer period. Personally I prefer setting trees one and two years of age.

There are some roots better adapted for certain soils. The myrobolin root is better adapted to the heavy soil, especially for French and Sugar prunes. The almond root is best adapted to the light sandy soils.

The nurseries use both almond and apricot root for Imperial prune trees. The apricot is much better than the almond. I find it is better for the fruitfulness or productive qualities of the Imperial prune.

I have made these few remarks in order to assist the fruit growers in making good selections of trees for the purpose of setting.

In making a selection of trees for setting, choose trees that have good roots. The root is the main source of supplying the life-giving forces to the tree and if it is not in a good healthy



Showing an Imperial Prune tree in its natural form when brought from the nursery, and the same tree properly cut to a stub, ready for setting. The cross marks indicate where the tree was budded onto the root.

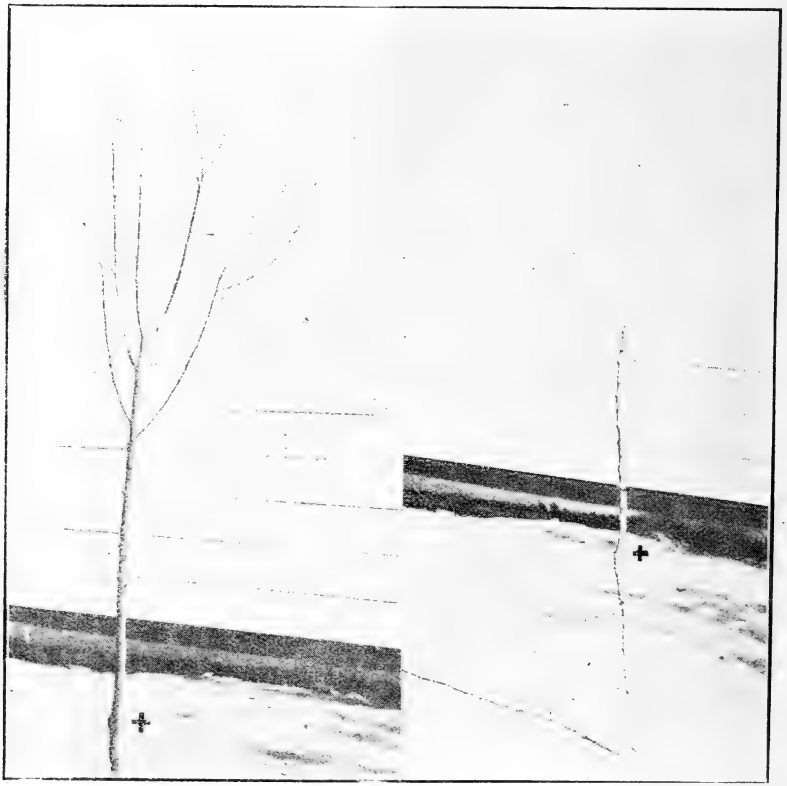
condition, free from knots and insects, it is deficient. Choose trees on which the buds are not too scattered. They are apt to be more fruitful. Of course, the strength and vitality of the tree is equally to be considered. Learn to detect the difference between trees grown from strong wood growth, and trees that are grown from wild and unfruitful wood. Demand the best from the nurseryman and he will surely meet the demands. The selection of good trees regardless of expense is the best economy. It is difficult to have good results from anything that is not started right. This is the reason that every fruit grower should be interested in the nursery stock, and seek to co-operate with and support the nurseryman that supplies the best trees, because it is one of the most important factors in the productiveness and longevity of the tree.

## LAYING OFF THE GROUND AND SETTING THE TREES.

For setting prune trees, lay off the ground so that the trees will be set in squares 22 ft. apart. The old system of setting prune trees was to set them 18 ft. apart, but we find that after the tree is over 20 years of age it needs more space for growth.

Examine the tree and the roots, and cut off all parts of the root that have been broken. Set the tree so that the roots are spread apart sufficiently to give it space enough to grow; see that the roots are perpendicular, giving them a chance to grow deep into the soil, instead of growing too much on the surface. Set the tree so that the bud of the tree will not be over 2 inches below the surface. By close observation the fruit grower will be able to recognize the part of the tree called the bud. It is the mark where the tree has been budded on to the root stock. Notice illustrations in this book of different varieties of trees selected from nursery stock, showing the markings of the bud on them.

Cut all deciduous fruit trees, such as prune, peach, apricot, pear, nectarine and their several varieties, to a heading 24 inches above the earth, just above a bud. Remove all the lateral



Showing a Peach tree in its natural form when brought from the nursery, and the same tree properly cut to a stub, ready for setting. The cross marks indicate where the tree was budded onto the root.

limbs, leaving it in the form of a stub, according to illustrations in this book.

When a tree is set the earth should be tramped around it, so the soil comes in close contact with the tree. If there is quite a lot of moisture in the soil at the time the tree is set, the moisture will pack the soil enough. This assists nature in helping the tree to become well grounded or firmly rooted in the earth.

Apricot, peach, pear and nectarine trees should be set 24 feet apart. This will give them plenty of room for spreading growth, and at the same time there is no waste of space. Cherry trees need more space. They should not be set closer than 28 feet. Walnut trees should be set 35 feet apart. They require more space than fruit trees.

I hope my readers have a clear understanding of how fruit trees should be set with the bud two inches beneath the surface of the earth, and cutting the tree about 24 inches above the earth, just above a bud. This is left on the tree to form its new growth. Remove all the lateral limbs, and leave the tree in the form of a stub. This method applies to fruit trees of the deciduous type. In cutting the tree just above the bud or cutting it to a head, care should be used to cut it so that there will not be a stub left on it caused from too much of the old growth left above the bud. It should be trimmed off even.

Walnut trees should be set so that the bud is two inches beneath the surface of the earth, the same as the fruit trees. The different nature of the walnut tree requires that it should be cut differently. Cut the walnut tree so that there is 36 to 40 inches of growth above the surface of the earth. Cut it between buds, and wax the cut so that it does not lose too much of the vitality of the tree. Remove all the lateral limbs, just the same as the fruit trees, leaving it in the form of a stub.

The almond tree is set the same as the fruit trees. Cut 24 inches above the earth and leave a few of the lateral limbs on the almond tree. Notice the illustration in this book of the almond tree showing the lateral limbs that have been left on it at setting time.

Showing an Almond tree in its natural form when brought from the nursery, and the same tree properly cut for setting. The cross marks show where the tree was budded onto the root.

Cut the almond tree between buds, the same as the walnut. If there are no buds between the lateral limbs, then cut just above a lateral limb, and cut the lateral limb back to 3 inches from the main limb. You will notice a picture of the almond tree that does away with the necessity of cutting to a lateral limb. The picture shows buds, and it is much better to cut to buds if possible. It requires less work and attention. This is a good point to remember in making a selection of trees in the nursery. If the tree has buds between the lateral limbs, it may seem to be a small thing to be considered, but it amounts to something in labor saving later.

The time of the year for setting trees in California is in January and February. The earth at that time is in readiness to start the growth of trees. If any other time of the year should be selected for setting trees, they would have a tendency to be retarded in their growth.

The laws of Nature are such that if anything is retarded in its infancy, it has a hard struggle to overcome this stunted condition and form new habits of growth.

French Prune tree, one year after planting, showing how the limbs branch out from the main body of the tree. Without systematic cutting it would be hard to form a good crotch from such a growth. Use the system of cutting all these limbs off except the strongest, and cut it back leaving only 4 inches of the new growth. You will have a good crotch the next year.

CHAPTER II.

# How to Cut the Tree After It Has Had One Year's Growth

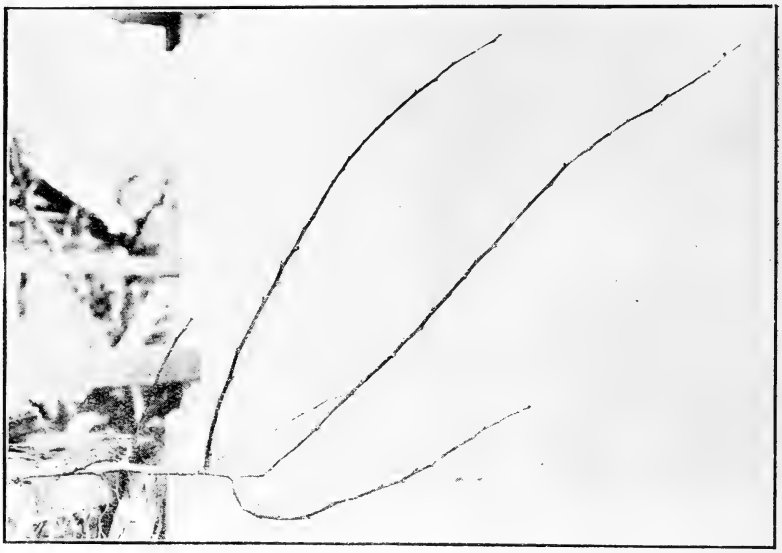
THIS chapter deals with cutting the young tree properly, after it has been set one year. Pruning the young tree at this age is very important, and should not be neglected, because this is the time to cut the tree to form a strong center or crotch.

The young tree that we cut in the form of a stub, at setting time, will have several small lateral limbs, after it has had a year's growth. Cut all of these new lateral limbs off except one, which we choose to form the main body of the tree. Choose the strongest and most vigorous of the lateral limbs for this purpose. After cutting off all the lateral limbs except one, cut this one that is chosen back until there is only three or four inches of the new growth left on the main body of the tree. The purpose we have had in cutting back this new lateral limb was to draw enough strength from the roots of the tree to form a strong body before we permit it to put forth its main branches. The tree has been given sufficient time for the strength and vitality of the root of the tree to become established before it starts the growth of its main branches.

Cut the tree just above a bud so that there will not be a stub or knot on the tree where the new branches start their growth.

Cutting the tree by this system, if strictly adhered to, will form a center or foundation of the tree that will stand the burden of heavy crops for many years without any danger of the crotch splitting. This system applies to the several varieties of deciduous fruit trees such as apricot, apple, peach, pear, prune, plum and nectarine.

Walnut trees should have quite a different system of form-



A French Prune limb, showing where it was cut the year before and the growth it has made.

ing the crotch from the fruit trees. Their nature is different. They are slower in growth. It requires more time for them to reach maturity.

If my readers will recall we left 36 inches of growth on the walnut tree. It was cut to a heading of 36 inches instead of 24 inches, as for the fruit trees. I will mention again that the cuts made on a walnut tree should be waxed because walnut trees have larger peth than the fruit trees, and if it is left exposed to the air, its strength is exhausted by drying out. This can be prevented by using a grafting wax, asphaltum or anything that will protect the cuts from the air. The lateral limbs that grow out on the walnut tree the first year should not be cut off. Let them grow until the second year.

Olive trees are of a different natural growth from the fruit trees. They should be treated the same as the walnut trees at

A French Prune limb, showing the second-year cutting. This second-year cutting is needed very much on old limbs, to develop new fruit spurs.

this stage of growth. Almond trees should not be pruned the first year. They are of the slow growth the same to some extent as the walnut.

I do not like to leave this subject without trying to make a strong impression on the minds of my readers of the value and importance of forming a strong crotch to the tree. This is an absolute necessity in securing the health, longevity and strength to endure storms and heavy fruitage, and is necessary to get the best out of a tree.

It represents the same principle that permeates all life. It is of little value to try to improve a structure of any kind when the framework or the foundation of the structure is deficient. This system of cutting back the first year's growth of the fruit trees conserves the vitality of the tree, and gives it a chance to draw sufficient nourishment from the root and at the same time gives the root a chance to conserve its energy before it assumes the responsibility of supporting the life of new branches.

The best season of the year to prune trees is from October

French Prune limb that shows where the fruit spurs are out to the end of the limb. There cannot be much new growth when the limbs are like this, as they are becoming weak. The illustration below shows how to cut the limb to renew its life.

French Prune limb, showing where it has been cut to a bud, leaving half of the new growth on the tree. This will produce an active growth and renew the life of the limb.

the 20th until February the 20th. The saps in the trees are not active at this time of the year.

In the spring, from the first of March until the first of July, the saps of the fruit trees are flowing upward. It is at this time of the year that a tree makes most of its new wood growth. After the first of July the sap begins to flow downward. The downward course is more gradual and less active. After the third month it begins a settled or restful period.

Experience has taught me that it is the safest to wait until after the twentieth of October to begin pruning fruit trees. The first of the pruning season is the best for productive and fruitful results. Planetary conditions are favorable at this time of the year. The sun passes through the zodiacal sign of Scorpio, which is a fruitful sign, at this time of the year.

I do not expect my readers to follow up the rule of pruning all of their trees at this time of the year. I know that the pruning season is good until after February the 20th, and it is necessary for those that have large orchards to make use of the entire pruning season to give their trees the care that is necessary for them. Try pruning trees that have not been very fruitful in the past in the early pruning season and see if there is not a marked improvement in their productiveness.

Some fruit growers make the mistake of pruning trees later, after they are in blossom and when the sap has become active in its upward course. This theory of pruning at this time of the year is with the idea that they can thin the fruit at the same time they prune the tree. I believe that it would only require a little investigation and observation to an interested mind to prove the folly of this system of pruning. The effects are that the tree begins to decline, and, in four or five years, if this is kept up, the tree will die. Perhaps one who is not deeply interested in the life of a tree would not notice the results in one year's time, and would continue to practice this method of pruning until it would be too late for the trees to survive. This is the main purpose I have in writing this book, to save the inexperienced fruit grower from practising such disastrous theories, which are so detrimental to the fruit growing industry. My aim is to give them theories and principles that have been thoroughly tested through many years of experience with close

Limb of a Pear tree, showing it before it was cut.

Same limb after it has been cut. This is the proper way to cut a pear limb

A French Prune limb, showing where to cut back, and also how to cut off the lateral limbs to keep life in this limb. Do not cut back to a lateral limb if it can be avoided. This picture represents a cut made to a limb, but in this case it could not be avoided because the wood was dead back to this limb and had to be removed to renew the life forces in the remaining part of the limb. In a case of this kind, cut back the ends of the lateral limbs also, because the dead wood indicates that the whole limb is in an impoverished condition and in need of the end clipping to renew its strength.

attention to the subject. I realize that very few people are willing or have the opportunity to focus so much attention on this subject. This is the reason I wish to make it possible for others to understand this system as I do, after many years of hard and difficult study and experimenting with different theories.

Having finished with the subject of pruning fruit trees and the natural flow of the saps in their annual course, I will mention the walnut tree. It differs from the fruit tree in its manifestation of life's forces. The saps are active at a different season of the year. It must have different care. It cannot be pruned properly the same time of the year that fruit trees are

An Apricot limb, showing how the lateral limbs grow, and where the buds are in between them, and an Apricot limb showing where it has been cut between buds instead of cutting to a lateral limb.

pruned. The entire nature of the tree is different. It has a very short season of inactivity or restfulness of the saps of the tree. This season comes after the 15th of March, and lasts until the 20th of April. Pruning the walnut tree at this time of the year is safe. At any other season there would be a risk of it being a detriment to the tree as well as to the fruitfulness for the coming season.

The almond tree can be pruned more like the fruit trees. The nature of the flow of the saps in their upward and downward course are similar and the season for pruning is about the same.

The olive tree is about the same. The only difference is in the first year's growth of the almond and olive tree. They are slower in growth and the system of removing all of the lateral limbs except one, to form a new trunk of the tree, should not be used. They should be let grow in their natural state until the second year before pruning them.

CHAPTER III.

# Pruning the Trees the Second and Third Years

THE second and third year's pruning of fruit trees should be with the idea of forming the main branches of the tree.

The second year the tree will have several new lateral limbs. They will branch out from the new growth that was left on the tree from the preceding year—the new limb that was chosen to form the new body of the tree, and was cut back to 3 or 4 inches of the old wood.

We must choose the strongest of the new lateral limbs to form the main branches of the tree. Choose from 3 to 5, judge as to their merit from their strength and vitality, and cut out all the rest of the lateral limbs except those that are chosen. The limbs that have been chosen to form the main branches of the tree should be cut back according to the strength and vitality of their growth. If the growth has been vigorous, amounting to 24 inches or more, cut it back to 8 inches of the main limb. If it has not been over 12 or 15 inches, cut it back to 4 or 6 inches of the main limb. The principle is to cut back more vigorously when the new growth is weak.

This principle of pruning applies to the deciduous fruit trees mentioned in the preceding chapter. The reason for cutting back weak limbs vigorously is to conserve the life giving forces in the root of the tree, giving it more time to generate more of the creative force, before there is a drawing to supply the vitality of the limb. It is useless to exhaust this creative force on a weak growth when it can be stored up to produce a more active growth later. This is a system that few understand and I hope to make it plain to my readers.

We also cut the tree at this age to give it the proper form in choosing the main branches. Of course, they should be

Four-year-old French Prune tree, showing the crotch and how it is pruned.

The same tree as on preceding page, showing its growth and the foliage the same year after it had leaved out.

chosen so that they will be alternating as much as possible. This gives the tree a better form and makes it well balanced.

The walnut tree at the second year period has just about arrived at the same stage of development that the fruit trees have reached the first year. There will be several lateral limbs branching out from the main part of the tree. They should not be cut off like we did with the fruit trees. Instead of cutting them all off, and leaving the tree in the form of a stub to form a new crotch, as we did in the case of the fruit trees, we choose from 3 to 5 of the best lateral limbs to form the main branches of the tree, the same as we do with fruit trees the second year of their growth. Thin out the weak lateral limbs, and use the system of cutting back the limbs that are chosen to form the main branches. Use judgment in the cutting back or end clipping. A weak growth should have a vigorous cutting back. A strong healthy growth does not need so much of the end clipped off. Always cut just above a bud so that the tree is smooth and free from knots and stubs caused from too much of the growth left above the bud that will start the new growth on the tree the following year.

The olive tree has a tendency to grow more of the lateral limbs than the walnut. This makes it necessary to do more thinning out. Just leave enough to form the main branches of the tree.

The almond tree is very similar to the olive. It requires about the same pruning.

The difference in the soil and climate affects the nature of a tree in its tendency to form a spreading or an upward growth. In very hot climates a spreading growth is desirable, because it protects the trunk of the tree from sunburn. The red clay soil in some sections of California produces a spreading growth. In sections of the State where the spreading growth is not needed, the pruning should be with the idea of producing more of the upward growth. This can be accomplished by cutting to an inside bud and thinning or cutting out more of the outside lateral limbs, changing the growth to the inside of the tree, which creates an upward growth. The opposite system, or cutting to an outside bud and thinning out the inside lateral limbs, will produce a spreading growth.

There are many points to be considered in pruning trees at the age of two and three years. This is a formation period. We depend on the pruning to form the tree on practical and useful lines that will fit the conditions that the tree will have to endure during its entire lifetime.

The red clay soil is in the section of the Sacramento Valley and in the foothills of San Joaquin Valley. There is a sandy soil of a different variety in a section near Fresno. This soil produces an upward growth. It has the hot climatic conditions to contend with. It is very necessary in this section to prune the trees to form the spreading growth. The two main points in pruning the tree when it has reached its second year's growth is, first to cut it back vigorously enough to store up or conserve the life giving forces of the tree, so that it is not overtaxed by supporting a weak growth that will not be strong enough in vitality to stand the burdens of fruit bearing in later years. Our main object should be to fortify the tree with enough strength before it is permitted to form too much wood growth.

The secondary object or idea we should have in view is to prune the tree so that it will be formed in harmony with the requirements that are necessary for practical use in its native climate.

This is also the time the fruit grower should protect his trees by spraying them. The menace of the curl leaf on the peach, pear and nectarine is causing the fruit grower much loss and may counteract the benefit that is derived from proper pruning. I recommend spraying these varieties of trees in February with a mixture of bluestone, sulphur and lime.

## THE THIRD YEAR'S GROWTH.

The third year the new growth will start from near the terminal part of the main branches of the tree, or where we made cuts on the tree at its second year's pruning. From the bud below the place we made the cut, after the tree has been cut back, the new growth will be strong and vigorous, which it would not have been if we had not cut back the preceding year. This new growth usually ranges from 36 to 40 inches. If it

French Prune tree, six years old, that has been properly pruned.

had not been cut back to give it renewed strength, there would be at least half of this growth lacking.

I hope my readers will test this system for themselves, and prove its value to their own satisfaction, and derive the benefit of understanding this principle that produces so much assistance in the growth of a tree.

The necessity and importance of the cutting back of weak limbs I wish to make as impressive as I can, because I know how reluctant the average fruit grower is in cutting their trees this way. They usually cut just the opposite. The strong

French Prune tree, seven years old, showing the old method of pruning. Compare it with the six-year-old tree, shown on preceding page, that has been pruned properly.

branches are cut more than the weak branches. This is just the principle that keeps an uneven growth. Cut the weak branches back more than the strong branches, and the tree will soon be brought out equally well proportioned.

The third year apricot trees will have a cluster of small lateral limbs on the main branches of the tree. If the new growth has been strong enough there will be some buds above this cluster of lateral limbs. If the limb is strong and has made a

growth of 3 feet or more, cut back to the buds above the lateral limbs. Note that the principle is not to cut back too vigorously healthy and strong branches.

If the new growth is not more than 15 inches, cut below the cluster of lateral limbs. If the new growth has been very weak, cut back more vigorously, so that it has a renewal of its vital power before it supports the cluster of lateral limbs.

All fruit trees have new lateral limbs the third year. They branch out between the lateral limbs that were chosen to form the main branches of the tree.

The new lateral limbs should be thinned out. Choose the strongest as far as possible and give them enough space to grow and receive enough strength from the parent limb and with the idea of forming the tree on symmetrical and practical lines.

I will mention again that we depend on the pruning at this time to form the foundation of the tree.

There are some points about the prevailing winds of different localities that should be considered in pruning. They have the effect of driving the growth of the trees to one side. Cut the side exposed to the wind more vigorously so as to strengthen it so it will be able to cope with the wind. Cut back the ends of the main limbs, leave more of the lateral limbs, do more thinning of these limbs on the side that is protected from the wind. This method will keep the tree well balanced.

CHAPTER IV.

# Pruning the Tree the Fourth Year

THE fourth year's pruning of fruit trees should be for the purpose of preparing the tree for bearing fruit. At this early age there should not be too much fruit bearing wood left on the tree. It overtaxes the strength of the young tree before it is ready to assume the responsibility of productiveness.

The early years in the life of the tree are similar to life in the higher kingdoms. It is the period for developing the body that will stand for many years. The energy or life-giving forces should be directed so as to form strong vigorous wood growth and not be permitted to exhaust this energy in the creative or reproductive centers. The life of the tree can be prolonged by the proper care in its formative period.

We left between 6 and 8 inches of the new growth on the main limbs of the tree the second and third years. We do the same again the fourth year. Cut according to the strength and vitality of the new growth. If the new growth is vigorous, leave about 8 inches of new wood on the tree; if medium, about 6 inches; if very weak, only leave 4 inches of the new growth on the tree. The fourth year the tree will have several new lateral limbs. About one-third of these should be thinned out. Leave the short fruit spurs on the tree. Thin out the limbs so that the remaining limbs have room for growth and also for the purpose of giving the tree enough ventilation and the sun exposure that is necessary for a strong, hardy tree.

These cuts have no influence on the strength and vitality of the tree. It is the end clipping from the main branches that we depend on to draw forth the life-giving forces in the tree.

The cherry tree is more sensitive than other fruit trees and it has a tendency to grow upward in the state of California. The fourth year's end clipping should be with the idea of producing a spreading growth. Use the system of cutting back to about 6 inches. Make the cut just above an outside bud. Cut to a leaf bud.

Cherry tree, three years old, that has been pruned properly to produce the spreading growth.

I wish to explain the difference in the appearance of a leaf bud and a fruit bud. The leaf bud is a long pointed bud. The fruit bud is a round, short bud. A little observation will soon teach the fruit grower the difference between leaf buds and fruit buds. This is an important thing to know, as it has so much to do with making the effective cuts on a tree. Cutting to a fruit bud often affects the new growth and counteracts the end clipping. All fruit trees are influenced by this. On account of the sensitive nature of the cherry tree, it is more deeply affected than any of the other variety of trees.

The cherry tree does not have as many lateral limbs as other fruit trees, so it is not necessary to thin out the lateral limbs.

Careful end clipping is all the pruning that is needed for the cherry tree. This has caused many fruit growers to form the idea that cherry trees should not be pruned. This is a mistake. It is just as necessary that they should have the end clipping to draw forth the vital forces from the root of the tree as any other tree, and they should be cut to form the spreading growth that is practical for easy fruit gathering and it aids the setting of the tree.

Pruning the walnut tree the fourth year should be guided by the growth of the tree. If the growth has not been vigorous, cut off about 6 inches from the main limbs. Use the same system of end clipping that is used on the fruit trees. It has the same effect of renewing the life of the tree. If it has been very vigorous in its growth, do not cut it, because its growth will be sufficient for this stage of the growth of a walnut tree. The maturity of walnut trees is slower than fruit trees, and it is best not to force a too rapid growth for its nature.

The almond tree, if it is not very weak in its growth, does not need the end clipping the fourth year. It will need the thinning out of the lateral limbs. If there has been some unnatural retarding of its growth, resort to cutting back about 6 inches to a cluster of buds, leaving the buds on the main limb.

The olive tree does not require the end clipping the fourth year because the growth should not be hastened. Give it plenty of time to form its wood growth. The attention should be given to cutting the lateral limbs. Thin them out carefully. Cut them close to the parent limb so that there are no knots or dead stubs left on the tree. These are points that seem small, but they are worthy of giving some attention to.

Some soils do not produce a very active growth of the olive tree. Do not make the mistake of trying to crowd the growth by end clipping, if the soil is weak. Time is the only proper method for the olive tree at this age. Strengthen the soil by using the proper fertilizer and cultivation.

Thinning the lateral limbs of the olive tree keeps the vital forces stored in the tree, thereby retaining its strength for new growth, and does away with the necessity of the end clipping, which is so essential to the fruit trees at this age.

Sugar Prune tree after it has been properly pruned. This should be done every year.

Franquette Walnut tree, 4 years old. This tree shows the new growth after it has been properly pruned.

The different varieties of prune trees should be cut back about half of the new growth the fourth year. Thin out all cross lateral limbs. Leave all the fruit spurs. Do not thin out the fruit. Use the same system on the peach, pear, apricot and nectarine trees, and continue the same system of pruning these varieties of deciduous fruit trees every year until they are 8 or 9 years of age. Leave about the same amount of new wood growth each year. This will form strong healthy trees, well able to survive for many years of active fruit bearing.

The prune trees, excepting the sugar prune, do not need any pruning after the fourth year until they are about 7 years of age, except to thin out the cross limbs, cut out the weaker lateral limbs. It is always best to cut out the limbs that Nature has not endowed with the strength to survive. They will die on the tree if left on it, after the expenditure of the strength of the tree has been given to the useless limbs. This is poor economy to carry useless burdens. It is the lack of attention to these little things that exhausts the life of a tree, and there is no compensation for it.

The sugar prune requires the end clipping every year. The limbs need this to strengthen them sufficiently to bear the burden of their heavy fruitage.

There are many different varieties of walnut trees. Some of them differ so much in their nature that it is necessary to make some difference in pruning them after the fourth year.

The Franquette and the common English walnut are more vigorous in their growth than the Mayette. It requires more time for the Mayette walnut to mature. It is a heavier fruit bearing tree, which makes it necessary to form a strong body to enable it to carry the heavy burdens that will be put upon it in its mature life.

It is very necessary to use the end clipping every two or three years on the Mayette walnut trees. There is very little need of thinning out the lateral limbs.

The Franquette and common English walnut should have the end clipping when they are 8 years of age. This will be enough pruning for them until they have reached their tenth year.

Cherry tree, nine years old. This tree is 30 ft. high. If it had been properly cut back and thinned out, it would not have been so difficult to gather the fruit.

I wish to remind my readers again that the season for pruning walnut trees is very short and different entirely from the fruit trees. This is an important point and should not be overlooked, because the flow and activity of the saps of the tree has everything to do with the health and longevity of a tree. Cutting at the right time conserves these saps and there is no useless waste of vitality.

The season for cutting the walnut trees is March and April. I prefer to cut as early in the season as possible so that they will not begin to bud before the pruning is completed.

Row of French Franquette Walnut trees. The picture shows that this variety of Walnut tree does not develop many long lateral limbs of the wood growth variety. The nature of the lateral limbs of this tree is of the fruit spur variety.

CHAPTER V.

# The Apple and the Fig Trees

I HAVE not mentioned the apple or fig trees. I have had a purpose in not dealing with them at the same time I did the other fruit trees. The system of pruning them is different, and I wish to deal with the system of pruning these two trees in the form of a synopsis of the entire system of pruning the tree from the first year until it has reached maturity. My object in doing this is to make this system of pruning so plain and impress it on the minds of my readers so that they cannot fail to understand it.

This book is written for the men that deal with the products of Mother Earth, and it is my aim to give them the knowledge that will enable them to assist nature in bringing out the best in a tree.

I realize that the man who deals with the soil has very little time for studying horticulture from books. His lessons are usually gained from the study of Nature, usually at the expense of experimenting without any knowledge as to what will be the result of the experiment.

I do not wish to elaborate on the subject of horticulture. My aim is to interest my readers in my system of pruning a tree so that they will understand it and have enough confidence in it to give it a trial and demonstrate its value for themselves.

The apple tree is specially adapted to soils that have plenty of moisture. It is only in the damp sections of the state of California that it is profitable to raise apples. The states of Oregon and Washington, where they have a much heavier rainfall, is much more adapted to apple growing.

Some of the apple growing sections of California draw their moisture from the fogs, but extensive irrigation is required. It would not be wise to set apple trees where there are not abundant resources to draw moisture from, either natural or artificial means of supplying the need.

Apple tree that has a tall, slender growth. This tree should have been cut back, so it would carry its fruit without breaking down or bending the limbs of the tree, and at the same time preventing sunburn.

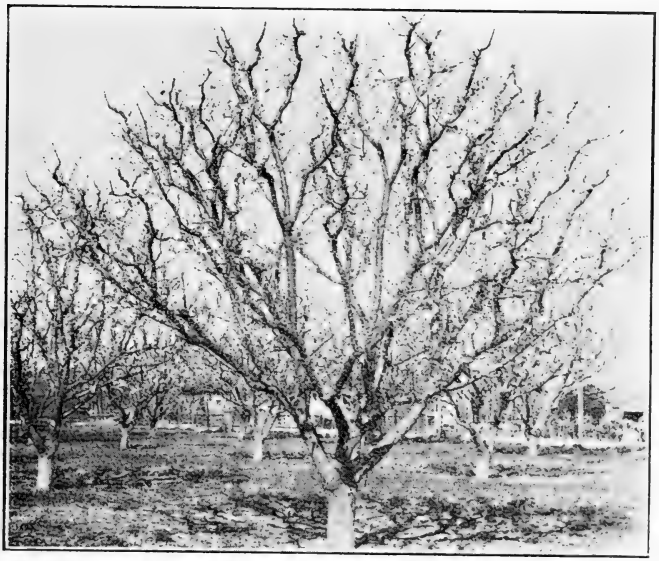
The setting of the apple tree varies a little from the other fruit trees. Set the bud 2 inches below the surface and cut the tree just above a bud, about 20 inches above the earth. Do not remove the lateral limbs. Lay off the ground so that the trees are set in 30 ft. squares. This gives plenty of space for spreading growth. Use more irrigation with apple trees than with other fruit trees. I will refer to this later in a chapter dealing with cultivation.

The growth of apple trees the first year is not as vigorous as other fruit trees. They are slower in reaching their maturity and they should not be cut back as vigorously as other fruit trees. Like the walnut, they should have time to mature.

Clip the end of the new growth back one-third the first year, leaving two-thirds of the new growth on the tree. Cut between buds, just above a leaf bud if possible. The second year should be a resting period for the apple tree.

There will be several new lateral limbs on the tree the second year. Leave these on the tree. The growth of the apple tree should not be hurried by pruning. Cutting the tree produces too much wood growth before the tree is old enough to supply the new growth with strength to support it. The third year's pruning is about the same as the second with other fruit trees. The tree should be pruned to form the tree. The apple needs a spreading growth as much as possible. Use the system of cutting back about 6 inches of the main limbs. Cut to outside buds for spreading growth. Thin out the lateral limbs about even or alternately, one on the inside and one on the outside. Leave them about 4 or 6 inches apart. Cut out all cross limbs close to the parent limb so that the tree will be smooth and free from knots caused from carelessness in pruning. The fourth year should be a resting period the same as the second year. The fifth year thin out the lateral and cross limbs the same as the third year, but do not cut back the ends of the main branches of the tree.

The sixth year is the right time to do the end clipping again. Cut back 6 inches of the main limbs. This will strengthen them before they assume the responsibility of bearing fruit. Cut to an outside bud. This creates the spreading growth that is de-



Apricot tree, showing the proper pruning to be done each year.

sirable for easy gathering of the fruit and it will stand the hardships of wind and the weight of the heavy load of fruit better than the upward growth. The horizontal growth has more strength to endure the hardships that the apple tree is subject to, from its heavy and burdensome fruit. A tall tree with upward growth is in danger of splitting when heavily laden with a full crop of fruit.

After the sixth year of the apple tree, care should be used to keep the lateral limbs well thinned out so that there is no waste of strength and at the same time it gives the tree enough space for ventilation, and exposure to the sun of all parts of the tree. This insures its health and strength to produce a high grade of fruit.

The lateral limbs should be cut out every year, unless there is a rest needed because of the tree not forming much density of growth. The end clipping every three years is enough for the apple tree. This will be sufficient to renew the life forces by drawing the saps to the terminal parts of the tree in a way that it is equally distributed to all parts of the tree, disseminating its strength so that there is no danger of part of the tree dying. This system can be applied through the entire life of the apple tree.

All that is necessary in assisting the growth of the apple tree is this scientific system of pruning it from the time it is set.

This system of pruning the apple tree is adapted to California climate. The eastern climate requires a different system. The end clipping cannot be relied on where the climate is cold. The thinning out of the lateral limbs is successful, but the short season for pruning makes the end clipping risky. The favorable season for pruning is after the ground has thawed out and before the beginning of the activity of the saps of the tree. This season is not very long. Sometimes not over three days, and very seldom lasts over ten days. The end clipping is not advisable. It has a tendency to weaken the tree in the eastern climates. However, I am confining my advice to California climate, as my experience has not been extensive in the eastern climates.

I will mention the apple tree again in a chapter dealing with

An 8-year-old Cherry tree that is no further advanced than a 3-year-old tree should be if pruned according to the Taylor system of pruning trees.

The same tree after it had been pruned according to the Taylor system. One year's growth has been 15 to 20 inches.

the subject of renewing the life of trees that have been neglected through the lack of proper pruning.

## THE FIG TREE.

The setting of the fig tree varies very little from other trees, except that it should not be cut to a heading. Leave it in its natural state. The young fig tree has too large or coarse a pith to stand cutting.

The first few years of the life of a fig tree should not be disturbed with pruning. There is very little pruning needed until it is 10 or 12 years of age. Then thin out the lateral limbs. Cut them close to the junction of the parent limb.

Never use the end clipping on fig trees. The pith of the tree is too coarse to stand it. Thinning out the lateral limbs after it has reached maturity will produce a better grade of fruit.

Like the apple tree the fig tree needs plenty of irrigation, but it will thrive better in soils that have less moisture. There are very few of the fruit growers that do any pruning to the fig tree.

I have tested the thinning out of the lateral limbs, and I find that this is a wonderful assistance in the growth of a fig tree, if practised every two or three years.

Cut off all the sprouts springing up from the root of the tree. These should have attention every year. They draw the strength from the root of the tree that should be directed to the main part of the tree.

CHAPTER VI.

# Renewing the Life of the Tree

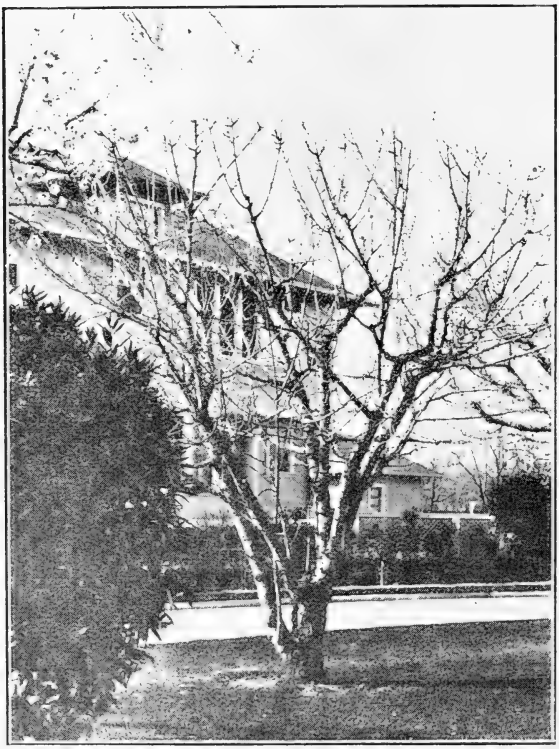
THIS chapter deals with principles that are more important than any other, as they are the principles that will be of more general use and will reach the needs of every fruit grower. They teach the system of renewing the life of the tree that has not had the assistance of the right principle of pruning.

Many orchardists are discouraged because their trees are in a dying condition, brought on through neglect or wrong methods of pruning, and many have orchards in which some of the trees are beginning to lose some of their productive qualities. In fact, there are very few orchards that cannot be improved and brought up to a higher standard of productivity, both in quantity and quality of fruit.

There are many trees that have had a short life, because they have not had the assistance they should have had in their early age. However, there is a chance for the orchardist to renew the life of his trees at any age. I have been able to demonstrate this through my own experience with an old orchard at Evergreen, in Santa Clara County, California. There are many orchards that can be saved as this one was. It was in a very poor condition and almost everybody doubted that it could be renewed. It is a living demonstration of what can be accomplished in restoring the life and productiveness of an orchard in a few years without resorting to grafting. There are very few orchards that have reached that stage of decline where it is necessary to have the entire orchard reset.

I will start this subject of renewing the life of old trees with some helpful remarks regarding the resetting of trees.

Trees can be reset the first year after old trees have been removed from the soil, although many orchardists believe that the soil is in too impoverished a condition to reset young trees at once. Set the tree as described in a previous chapter and use the system of cutting off all the lateral limbs except one after



An old Cherry tree that has had its life renewed by proper pruning—cutting off the ends of the limbs.

the first year's growth and cutting it back to 3 or 4 inches, which will strengthen the young tree, so that it will thrive, even if the soil is not up to a high standard and has become impoverished through the growth of old trees.

If the tree should be weak when it has reached its second year's growth, cut it back more vigorously than you would a tree that had been set in soil that had not been exhausted from the growth of old trees.

Peas, barley or vetch sowed and plowed under the following year enriches the soil and is very good for young trees, especially where trees are reset.

Trees that are reset may need a little more time, but they soon grow out equal to other trees. If pruned carefully and the soil is cared for, there is no need of loss of time in resetting, as so many orchardists think.

In caring for peach, pear and nectarine trees that have been neglected, I would advise spraying them for the curl leaf, with a mixture of lime, bluestone and sulphur. This is the best mixture to overcome the curl leaf that these variety of trees are subject to. This should be used in February before the leaves start.

Old trees that have not had the proper pruning in their youth need more careful pruning than those that have had proper pruning.

Where the tops of the trees are dying, cut back the new wood to 4 to 6 inches of all the main branches of the tree. If this should require cutting into wood over an inch in diameter, use a dressing of wax, made out of asphaltum and paraffin, proportioned 1 lb. of paraffin to 4 lbs. of asphaltum. The cutting back of the main limbs will make a drawing from the roots of the tree to these terminal parts.

Thin out the lateral limbs, leaving only those that are strong and give them enough space to receive a supply of vitality from the parent limb. A surplus of non-productive lateral limbs on a weak tree is more than it can afford to support. We want to avoid all waste of energy until the tree has regained its normal condition. Care should be used in cutting to buds instead of little limbs. Cutting to little limbs or fruit spurs weakens the

Apple tree that has been grafted. The picture shows how the limbs have been cut off properly. This is a good practice in California, but not in Eastern climate.

life-giving forces of the tree. Cutting to a leaf bud is the best cut that can be made on a tree. The long slender bud is the leaf bud. The round buds are the fruit buds.

All deciduous fruit trees, after they have reached 10 years of age, or mature growth, require the end clipping or cutting back of the main limbs from 4 to 6 inches. There is some variation as to how often this should be done. Some trees need the end clipping every year and some do not need it so often. I would advise the end clipping every year when the tree has been neglected, until it has been restored to normal and healthy condition.

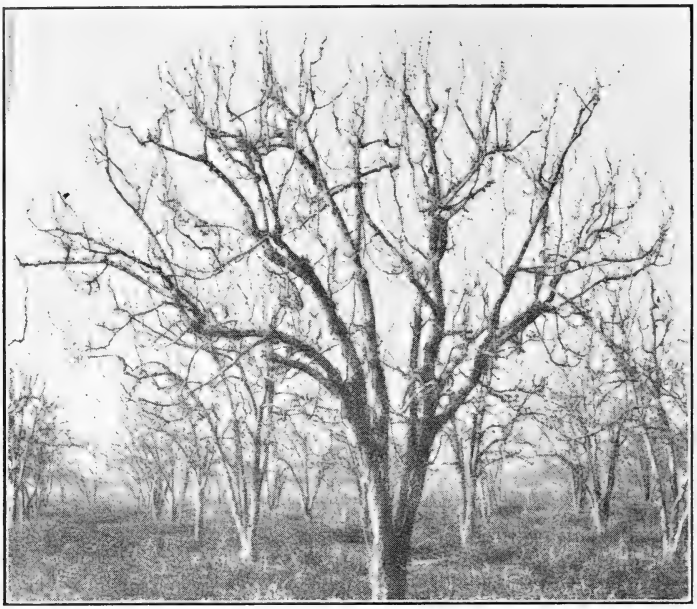
Soils that produce an active wood growth do away with the necessity of the end clipping every year.

The sugar prune tree requires strong and vigorous wood growth, because it produces so many fruit spurs. It needs a strong wood growth to support its heavy crop.

The principal difference in pruning a tree that has been neglected, and one that has had proper pruning, is cutting off all the dead wood on the tree and then cut it back just the same as an ordinary tree. Thin out the lateral limbs the same. Of course, there will be more thinning to do. It requires more work and attention to build up the strength of the tree after it has lost its health. Just the same principles of life that exist in the human body. If we neglect our health, we must have care and not overtax our strength until we have time to recuperate. It is the same in the life of a tree.

Cut out all the lateral limbs that are weak. Only retain those that are best fitted to survive. If close attention is given to the tree that is on the road to decline, I can promise that surprisingly favorable results will be obtained.

Every orchardist can be a physician to the tree if he will use the right system. The nature of tree life responds readily to assistance given by pruning, although there has been such little attention given to the systematic pruning of trees. I know of nothing in the scheme of life that has been so neglected. Man has accomplished great things with the cultivation of vegetable and animal life, but the life of the tree has not been given the at-



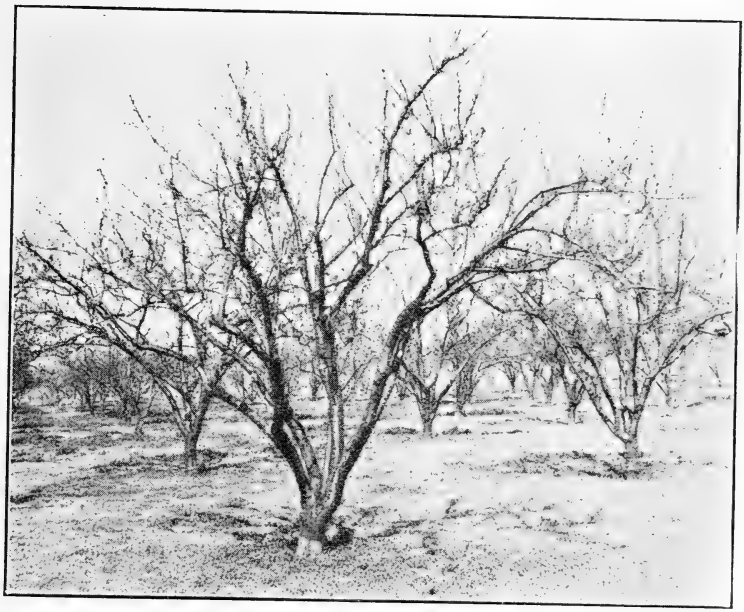
Pear tree, 11 years old. This picture shows the proper pruning of pear trees, which should be done every year.

tention that is due it. Let us hope that it is coming into its own higher expression, at the present age.

I hope my readers will take an interest in what every cut on a tree means for its health, productiveness and longevity.

Before I leave the subject of pruning trees, I will go over some of the main points again. The end clipping is necessary to draw the vitality and strength from the root of the tree to the terminal part of the tree. It disseminates its strength to all parts of the tree and produces a vigorous new wood growth and at the same time adding enough vigor to produce new fruit spurs.

The life of the tree is prolonged to a very old age, more than 60 years of age, perhaps much longer.



Imperial Prune tree on an almond root, showing the proper pruning of a neglected tree.

Cutting back the main limbs should be done with care. Cut to buds instead of lateral limbs, a leaf bud if possible. Cutting to a limb wastes the saps of the tree and weakens the tree.

Thin out the lateral limbs, remove the weakest, those that will not survive if left on the tree, give the remaining limbs enough space for light, ventilation and growth.

Fruit spurs live from one to seven years. Fruit spurs live longer on some varieties of trees than they do on other trees. Apricot, peach, pear and nectarine fruit spurs usually do not last over two years. Sometimes three years if the tree is strong and healthy. The proper end clipping and thinning out of the lateral limbs will strengthen the vitality of the tree enough to produce new fruit spurs as often as they are needed.

Picture of a Peach tree, 11 years old . The picture shows the tree after it has been pruned properly. This should be done every year.

Thin the fruit of the peach, pear, apricot and nectarine before the pits become hardened. Thin them so that the fruit is from 4 to 6 inches apart.

I will mention again the season for pruning trees. From October the 20th until February the 20th. If the trees have not been fruitful, try pruning them before the 23rd of November. This is a fruitful season, and cutting at that time assists Nature, or it is in harmony with Nature in its productive qualities.

If the orchardist will be loyal in practising the end clipping every year on old trees, he will soon have a renewed orchard. The first year's growth will be weak and perhaps will not yield a large crop. The new growth on the tree may not be over 3

Showing a Sugar Prune tree grafted onto an old tree, and how it should be pruned.

inches. Cut half of this back. The next year's growth will be stronger. Cut away about half of the new growth each year until it makes a strong new growth and then cut back about 4 or 6 inches. After following this up for three or four years the life of the tree will be sufficiently renewed to produce enough fruit spurs to raise a full crop of fruit.

The French prune has a heavier growth of fruit spurs than almost any other variety of tree. The end clipping is very essential where the fruitage is heavy because of the need of strong and vigorous wood growth to support the fruit.

French Prune tree, 8 years old, before it has been pruned.

The same tree as on preceding page, after it has been properly pruned.

CHAPTER VII.

# Cultivation and Irrigation

THIS chapter deals with cultivation of the soil for trees with a few remarks that will aid the fruit grower in obtaining the best results by giving the proper attention to the soil, at the proper season of the year.

There is a time or season to do all things. Much depends on studying the laws of Nature and the harmony existing in Nature. "Man was created to have dominion over the earth," so far as he conforms to natural laws. In the state of California we depend much on irrigation for sufficient moisture to develop the productiveness of our orchards. The ingenuity of the mind of man has supplied the element that Nature has lacked in this section of the earth, but if we did not have a natural example to guide us in seeing the effect of rainfall in other productive sections of the world, we would have to experiment to find out what element we needed. Since we know that it requires so much of the element of moisture to make the earth produce, we now use scientific methods more than in former periods, and in this State we have more need for scientic principles than in the States where they depend on Nature to supply the moisture.

Judgment must be used to obtain the best results from irrigation. It must be used to supply the lack in the natural supply from rainfall. The rainfall of this State varies in different parts of the State. Some years the rainfall is short and sometimes it is quite a wet season. If the rainfall has been light or if it is a dry section of the State, if there has not been much rainfall before the latter part of January, I would begin irrigation and irrigate thoroughly the last of January. This is the time of the year that moisture is needed to start the trees on their upward flow of saps and they should not be deprived of their need of moisture at this time.

If there has been a heavy rainfall before the latter part of

January, and the trees have been supplied through Nature with sufficient moisture, the first irrigation can be dispensed with.

The second irrigation should be the last of April. At this time of the year the earth is in a condition to absorb the moisture. It does not evaporate as it does later in the season. It is advisable to do work at the time that it is effective and full benefit can be derived from it. Many orchardists do much irrigation with little beneficial results from it.

The irrigation in the fall of the year is not necessary unless it is for the purpose of raising a cover crop.

These rules for irrigation can be applied to all deciduous fruit trees except apple, pear and fig trees. These trees require more moisture. They should be irrigated oftener, about four times a year. The last of January if it is a dry season. If it is not, the first irrigation should be the last of April, the same as other fruit trees. The second irrigation the last of May, and the third the latter part of June.

Some orchardists think that apricots, peaches and prunes should have the late irrigation, but I have tested it thoroughly and found that late moisture affects the fruit, so that it is lacking in the necessary sugar.

The walnut trees start their upward saps later than the fruit trees, and a late irrigation is in perfect harmony with their nature, the last of April and the last of May. These two irrigations are enough moisture for the walnut tree.

I do not intend to deal with fertilization to any great extent, because it is not in my line. There are soil experts that specialize on this subject and I advise applying to them for assistance and knowledge as to what kind of fertilizer is needed to supply the elements that are lacking in the soil. However, I will give a few simple hints that will be helpful, in regard to cover crops and other methods of fertilization.

Cover crops, such as vetch or burr clover, sowed in the fall of the year just before or shortly after the first rains and plowed under the following year, the latter part of March or the first of April, is good to make the heavy soils more loamy and easier for it to become pulverized. It makes it better for cultivation, such as plowing and disking. The cover crops

have the effect of retaining the moisture in the light, sandy soils.

Manure spread in the fall of the year will hold moisture, but I prefer spreading it in the winter, December and January, because the soil absorbs more of its strength at that time.

One good plowing a year after the trees are set, in March or April, will be sufficient to keep the soil in proper condition for fruit trees, if the ground is well cultivated by disking.

CHAPTER VIII.

# Drying Fruit

I WANT to mention the importance of properly drying fruit. This subject is very important and does not concern the individual fruit grower alone, but has so much bearing on the taste of the fruit that it influences the entire fruit market value. There is no chance to create a great demand for a poor grade of fruit, lacking in palatable and digestive qualities because of poor methods of drying. The last few years the eastern markets have received fruit from California that was soured at the time it was dried. The fruit grower makes a mistake for himself and all fruit growers by sending out fruit to the market that has not been carefully dried. The fruit growers have begun to take an interest in this subject and should try to impress it on the minds of the public.

The following is from a circular given out by the "Growers Information Bureau," 155 West Santa Clara St., San Jose, California. It includes the methods of drying fruit that I have used. I have always taken great interest in drying fruit, and the information given out by the "Growers Information Bureau" was compiled by a Mr. Harliss, who had been in my employ for many years. I was pleased to see that they are interested in this subject, because I realize how much depends on well dried fruit.

"QUALITY DRIED APRICOTS.

"First quality dried apricots sell the easiest, and at the best prices. The production of such apricots in quantity calls for a high degree of executive ability and painstaking attention to detail. In the following discussion are indicated some of the more important points to be considered in preparing dried apricots. It is assumed that the orchard has been well cared for and that where the fruit has set too heavily it has been properly thinned. Before the fruit is ripe the trays and boxes should

be washed in warm water if possible. Rubbing trays with steel brushes is a poor substitute for the wet bath, because the steel brush merely loosens the dirt and mold, which later soils the fruit wherever it touches the tray. Before a pound of fruit is picked or cut, both trays and boxes should be cleaned.

"The ripeness at which apricots are picked is an important factor. The fruit should be fully ripe, but not too ripe. Too ripe fruit makes too many slabs, costs more to pick and cut, and when dry is too dark in color and sells at a low price.

"Too green fruit shrinks excessively in drying and forms a very undesirable product. Apricots for drying should be picked and handled as carefully as those intended for canning. Shaking the fruit to the ground is false economy. A receiving platform at the cutting shed is a great convenience.

"For good results, sharp knives in the hands of the cutter should be insisted on. The fruit must be cut smoothly and squarely on the seam all the way round, and the halves placed accurately, cut side up, on the trays. The soft fruit should be kept separate from the properly ripened fruit, and should be prepared for the tray by an expert, who is paid, preferably, by the hour. Careful cutting will save much ripe fruit that would otherwise go to the slabs.

"The quality of the finished product also depends on the sulphuring. The smokehouse should be tight. Tight construction is not necessarily costly. A very effective smoke-house can be made of rough boards covered on the outside with roofing paper. About three and a half hours exposure to the sulphur fumes is sufficient, if a good free-burning sulphur is used.

"Fruit that is properly sulphured retains its bright color much longer than poorly sulphured fruit. The quantity of sulphur used and the time of exposure are, to a certain extent, matters of judgment. Large apricots require more sulphur than small, because there is a larger weight of such fruit on the tray. If the sulphur house is fairly tight, and there are 200 pounds of fruit in it, 5 pounds of sulphur should be ample. The pit cups in properly sulphured apricots should be half filled with syrup when withdrawn from the sulphur houses. Over-sulphuring should be avoided. Apricots that are over-sulphured have an

undesirable appearance, and stick tightly to the trays. Care should be exercised in a choice of dry ground. Placing the fruit where it is exposed to dust from the road or lanes in the orchard should be avoided. If one has plenty of trays, the last part of the curing may take place in the stack, this insuring a product with a uniform moisture content throughout."

This information is very good for drying apricots. I have nothing to add to it, only that I hope the apricot growers will apply the rules given out to them. If they will, they will soon bring up the standard of their fruit and create a greater demand in the world markets for California dried fruit.

The prune industry is very important in the State of California, and the proper drying process is even more important a factor than with apricots, because there is no market to amount to anything for prunes outside of the dried product. I have been very successful with prune drying. I never have any buckskins, bloats or frogs. These are defects caused from improper dipping and drying.

Many fruit growers have a certain percentage that they have to sell as second grade fruit, because of carelessness or lack of understanding of how to dip their fruit.

## DIPPING AND DRYING PRUNES.

This method of dipping the Sugar and Imperial prune will insure a high grade of fruit, free from buckskins, bloats or frogs: Make a very weak solution of lye; proportion, sixty gallons of water to two pounds of lye. Keep this boiling hot. Dip the prunes in this solution very quickly. Do not leave them in the lye longer than five seconds. This does not cook the prune too much. If they are left in the dip too long, the fruit is half cooked and becomes soggy before it dries. It may sour. It makes a very undesirable grade of fruit. I usually dip prunes as fast as they are picked. It is much better for the fruit if it is not let stand in boxes too long.

When the prunes are dipped and have been placed on the trays to dry, leave them on the trays two days, and then roll them over on the other side. This should be done by hand so they will

not mash. This rolling is to keep them from molding, and it is an assistance in drying the fruit faster. If the weather is cloudy and damp, roll them every day. If the weather is nice, it will not be necessary to use the rolling process more than two times.

For dipping French prunes a stronger lye solution is needed than for the two varieties that we have mentioned. Make a solution of lye, proportioned sixty gallons of water to six or seven pounds of lye. Keep the lye boiling hot while dipping the fruit, the same as with the other varieties. Dip them quick; do not leave them in the dip over five seconds, and I will assure you that if this is strictly adhered to the fruit will not have any of the seconds in it that we have mentioned.

CHAPTER IX.

# Cultivation of Grape Vines

START the growth of grape vines by choosing cuttings that have from six to eight buds on them. They should be set so that four buds are in the ground and two buds are above the surface of the ground. The two buds above the earth start the wood and fruit growth of the vine; the buds under the ground produce the root of the vine.

After the vines have made the first year's growth, cut off all the new canes except one which is to form the vine. Choose the strongest and most vigorous cane for this purpose, and, if it should be over two feet in length, and it is to be a trellised vine, cut off one foot of the end of this cane.

The second year's growth should be treated on the same principle. Cut off all the new canes the same as you did the first year, again choosing the strongest to perpetuate the growth of the vine. After the canes are two or three years old they will have new canes branching out from them and extending back to the root of the vine. The end of these should be cut back, leaving only two buds on each lateral cane, one for the purpose of creating wood growth, the other to produce fruit growth.

This end clipping of the grape vine assists Nature to conserve its energy in such a way that there is no waste of vitality to support a wood or fruit growth that is not strong enough to be useful to the vine either in a hardy wood growth or a productive fruit growth.

Cutting off the surplus growth concentrates all the energy of the vine to the two buds, which is sufficient to produce both wood and fruit growth. If the cane was cut back to the one bud, it would produce a strong wood growth but the fruit would be lacking. If it should be cut back to three or more buds it would have the effect of scattering its forces so that neither the wood growth nor the fruit growth would reach a very high standard.

If there are suckers or wild growth springing up from the root of the vine, cut them off during the summer months. They are of no use to the vine and they are drawing as much vitality from the root as the useful part of the vine.

## CUTTING GRAPE VINES TO A HEADING.

If it is desired to cut grape vines to form a heading, after the first year's growth, cut off all the lateral canes, except the strongest one and then cut it back from 6 to 12 inches from the ground, using judgment as to the height that is desired to start the heading of the vine from the ground.

The second year choose from three to five of the strongest canes to form the head of the vine, and cut these canes back to two buds. Leave only the two buds on each cane, one being for wood growth and the other for fruit growth. This system of choosing the strongest canes and cutting them back to two buds should be used every year during the life of the vine. This will perpetuate the growth of the vine and if grape growers will adhere strictly to this system of cutting the canes back to two buds, I am sure they will be well repaid.

The proper time for pruning grape vines is during the months of December and January. In the Eastern states, where the climate is severe, this system of pruning can be followed with success, but the vines should be lightly covered with straw after the pruning.

It is best to use cuttings from a wild grape vine that grows in the States of Missouri or Illinois for the purpose of setting. Their nature is strong enough to overcome the phylloxera, which destroys so many of the other varieties some time during their life. The nurseries use these varieties of cuttings for the stock and any variety of grape vine can be grafted on to it. It is termed resistant vine for phylloxera.

This will be useful knowledge to the grape grower who wants to start his own nursery stock.

The life of grape vines that have been neglected and are dying at the ends can be renewed by using the system of cutting back to two buds and cutting out the suckers.

Grape vines should be well sulphured. The proper time of the year is just after they have dropped their blossoms and the little grapes are beginning to form. This sulphuring is to prevent mildew.

## AN EFFECTIVE WAY TO SULPHUR.

Take a gunny sack and put about a quart of sulphur in it. Shake the sulphur through the sack onto the vines. This should be done early in the morning while the dew is still on the vines, as the moisture aids in retaining the sulphur.

Sulphur the vines three times, with an interval of about five days between each application.

Sulphur also strengthens the grape vines as well as being a preventative for mildew.

CHAPTER X.

# Fruit Growing in the Eastern States

SINCE starting to write this book, I made a trip East, making several stops en route in the different states throughout the South, East and Middle West. I wished to investigate the nature of the soil, the climatic conditions and the principles of pruning trees suitable to bring forth the best in the life of a tree under the existing conditions there.

I found thousands of acres of land in the southern states that could be utilized to a very profitable advantage through fruit growing by adopting the same system that is given in this book. There is enough similarity of climatic conditions to use the same system of pruning as we do in California. In the southeastern states irrigation is not necessary. The home market would support quite a fruit growing industry, in that section.

The season for pruning trees in the southern states is not as long as in California. Fruit growers should try to study the life of a tree enough to familiarize themselves with the season when the sap of the tree is restful, not active either in its upward or downward course.

The eastern and middle-west states can apply the same system, but they have a much shorter period of pruning than California or the South.

It is not advisable to prune when the soil is freezing or when it is severely cold weather, and the trees should not be cut after the saps have begun their upward course in the spring of the year.

It is likewise not advisable to cut trees in the fall of the year before the cold weather. That leaves a very short season in the spring of the year that is favorable for pruning a tree to bring out the best that is in it. This time usually ranges from 3 to 10 days.

## SAN JOSE SCALE.

I found many fruit growers of the East very much discouraged with fruit growing through the affection of the trees by San Jose scale. They have been using lime and sulphur but it has not proved successful. I recommend a solution made of caustic soda, proportioned 6 lbs. to one hundred gallons of water. The best time to apply this remedy is in the fall of the year before the weather turns cold.